

Confronting meat consumers with the slaughter of animals for meat production

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Abstract

Background: Organisations who want to reduce meat consumption are confronting meat consumers with images of the meat production process. Current available literature however suggests that attitudes towards meat production have no influence in consumers' behaviour regarding meat consumption. At the same time it is suggested that meat consumers do not like to be confronted with the meat production process because of an increased distance between animals and meat products in the purchase environment.

Objective: Insights in willingness to be confronted with meat production by watching a slaughter video, elaborate on the gap between production and consumption and the role of the place where meat is bought the on willingness to watch this video.

Methodology: 281 respondents were asked about their meat consumption and attitudes towards meat attributes. After that they were asked whether they would like to watch a video where an animal is killed for meat production.

Results: 63 percent of the meat consumers wanted to watch the video. The place where someone buys meat had no influence in the willingness to watch. Those who did not watched the slaughter video are more blood sensitive and tend to eat less meat per week. Discomfort towards the slaughter of animals and watching this video negatively influenced meat consumption levels.

Discussion: Organisations that want to reduce meat consumption by confronting them with images of the meat production process might be advises to focus on the aspect of the killing of an animal than to focus on the animal welfare condition in order to reduce meat consumption. It is however not known if would influence future meat consumption, since there is a high psychological distance towards the slaughter of animals in the current meat purchase environment.

Index

1. Introduction.....	1
2. Theoretical background	2
2.1 The relationship between eating meat and killing animals.....	2
2.2 Psychological balance between consumption of meat and killing of animals	2
2.3 Changes in the meat environment.....	4
2.4 Willingness to be confronted with slaughtering process	5
2.5 Predictive power of meat characteristics.....	6
2.6 Effect of meat consumption	7
2.7 Conceptual framework	7
3. Methodology	9
3.1 Design and respondents.....	9
3.2 Procedure.....	9
3.3 Control variables for meat consumption and willingness to watch slaughter video.	11
3.4 Data analysis.....	12
4. Results:	13
4.1 Overview.....	13
4.2 Willingness to watch slaughtering video	13
4.3 H1, H2, H3: Willingness to watch the slaughter video	14
4.4 H4, H5, H6 Meat consumption.....	15
5. Discussion	17
6. References	19
7. Appendix: Online Survey	22

Introduction

The current amount of meat consumption in the Netherlands is more than they nutritionally require. Meat is an attractive type of food to eat; its sensory properties are well liked by many consumers and values towards meat and meat consumption are much more powerful than values towards other foods. Furthermore, meat consumption is also associated with social events, to establish social distinctions or to foster social unity (Beardsworth and Keil 1997, Grunert 1997, Aiking, Boer et al. 2006, deFrance 2009, Roberts 2009: 208). Although meat contains proteins which are needed for the development of the human body and mind, the average protein intake for Dutch consumer is about 37 percent more than the recommended daily intake (Sebek and Temme 2009). Accompanied with the high ecological footprint of meat production, it is recommended for consumers to lower their meat consumption (Aiking, Boer et al. 2006). Major consumer groups however, for example in Australia, do not think of reducing meat consumption as having a high environmental impact, and although there is a growing trend in replacing animal products with plant-based substitutes, the acceptance of these products is still rather low for a major group of consumers (Lea and Worsley 2003, Schösler, Boer et al. 2012).

The Dutch animal welfare organisation 'Wakker Dier' tries to influence consumers in reducing meat consumption or to eat more animal-friendly meat by reminding consumers about the current practises of meat production. This is done by confronting consumers with images or videos of the current living conditions of animals held for conventional meat production. However, there seems to be a gap between the attitude towards meat production and actual meat consumption. Negative responses towards animal welfare situations do not necessarily mean that consumers stop eating meat products. In fact, some consumers state that there is no link between the negative images of production methods and their purchase behaviour (Ngapo, Dransfield et al. 2004). Several studies have shown that consumers care about the ethics of killing an animal for meat production and the welfare conditions of livestock animals. However, the majority of consumers do not think about either the ethics in killing or the welfare conditions of an animal when they buy meat product (Eastwood 1993, Verbeke and Viaene 1999, Ngapo, Dransfield et al. 2004, Grunert 2006, Cerjak, Karolyi et al. 2011).

At the same time, it is suggested that consumers are getting more and more uncomfortable in dealing with the fact that the meat they eat originates from once living animals. Consumers prefer not to think too directly about where their meat comes and reminders are more off-putting than informing the modern consumer (Fiddes 1991, Mayfield, Bennett et al. 2007, Dagevos, Voordouw et al. 2012). Accompanied with this, although we like to be able to pay a low price for meat products, thinking about the conditions in which these animals are held in results in negative responses by consumers (Te Velde, Aarts et al. 2002, Vanhonacker, Verbeke et al. 2008). The fact that consumers feel positive about the consumption of meat but feel rather negative about meat production raises questions in how consumers deal with these conflicting attitudes. It seems that there is a weak relation between a person's attitude towards meat production and his meat consumption.

This research has multiple goals. At first, it is examined to what extend meat consumers want to be confronted with meat production and if this has any influence on their meat consumption. Also, the distance between attitudes towards meat production and meat consumption is examined. Finally, it is examined whether the de-animalized meat purchasing environment has any influence in the consumer's willingness to be confronted with meat production. A survey is conducted where respondents have had the opportunity to watch a video of an animal being slaughtered, part of the meat production process. Insights in the relationship between willingness to watch slaughter videos and meat consumption could be helpful in making a campaign that could show consumers more information about the meat production process. It could imply that giving consumers more information about the meat production process could stimulate consumers to reduce their meat consumption because their moral standards do not align with their behaviour.

2. Theoretical background

2.1 The relationship between eating meat and killing animals

Meat is both associated with positive (eg. taste, social value) and negative attributes (e.g. killing an animal, livestock's welfare conditions) (Grunert 1997, Roberts 2009: 208). At first glance it seems illogical that a negative attitude towards meat production and positive attitude towards meat consumption can occur simultaneously. When someone consumes a meat product he might feel bad when he is reminded about the fact that an animal is killed in order to provide meat product. This should create a tension between the positive and negative attributes of meat. It is however not likely that a consumer thinks about dead animals every time when he decides to buy a meat product. At the point of decision making, the negative attitudes are overruled by the positive attitudes. At the same time, a consumer might hold strong negative attitudes when giving answer in a survey towards the welfare conditions of cattle in livestock. This is called the citizen-consumer gap, where many consumers do not act as consistently on their own opinion towards meat consumption and/or animal welfare (de Bakker and Dagevos 2012). This gap is further explained with use of the construal level theory.

The construal level theory proposes that objects and events are mentally represented at different levels of psychological distance and abstraction, which influences the type of decision making and action. Psychological distance is egocentric: A person has himself as reference point in the here and now, and the different ways in which an object might be removed from that point—in time, in space and in social distance—constitute different distance dimensions (Trope and Liberman 2010). High-level construals are represented in terms of desirability, whereas low-level construals are represented in terms of feasibility (Liberman and Trope 1998). For example, at the moment of purchase a consumer wants to buy a low-priced meat product since that suits their budget, while in terms of desirability that same person wants animals to live a live in good animal welfare conditions without any suffering.

Ethical choices, such as whether it is humane to kill an animal for human consumption, typically refer to socially or temporally distant outcomes, while actual purchasing typically concerns the immediate personal outcomes of the individual. It may be preferred in the distant future but not in any present (van Dam and van Trijp 2013). In this case it is likely that attitudes such as ethics in killing animals, animal welfare and environmental impact of meat production are less important in a purchase situation than quality, taste and price. These attributes in favour of meat consumption come to mind when deciding to buy a meat product. A person who is questioned about their moral values towards the welfare conditions of animals in a survey might give an answer that is different from their behaviour as a meat consumer. At the moment of purchase, he might think in terms of low-level construals, such as 'what do I like to eat today', 'what products do my friends prefer' and 'how much meat can I buy for the lowest available price', instead of thinking about the meat production process. The psychological distance might explain why consumers eat meat but feel discomfort when being confronted with this meat production.

2.2 Psychological balance between consumption of meat and killing of animals

The gap between attitudes towards meat production and actual meat consumption is further elaborated with use of the balance theory. This theory conceptualizes the drive for a psychological balance that a person has between interlinked objects (Heider 1958). The psychological balance should be made between a person, an object and a variable that is interlinked with the two. In this case, killing animals is the interlinked variable between a consumer and eating meat products.

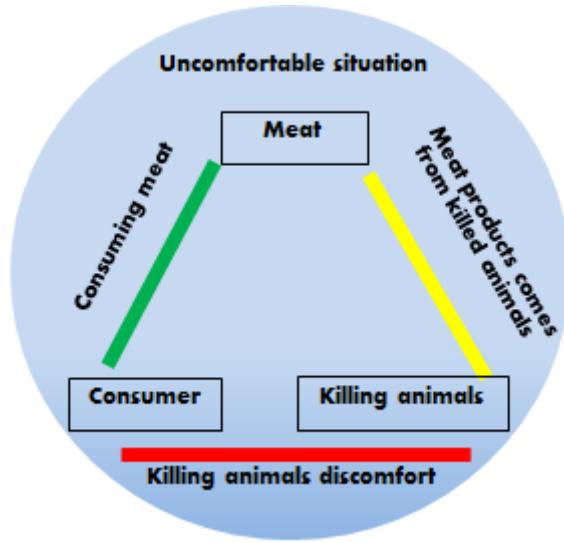


Fig. 1: Displeasing attitude situation, based on Heider's balance theory

Someone who has a positive attitude towards meat consumption but a negative attitude towards the killing of an animal faces a psychological imbalance. This imbalance is an unpleasant situation for the consumer, and according to the balance theory, this person will seek for psychological balance. There are three potential solutions to restore the psychological balance. A person can either (1) change his behaviour towards meat consumption by restraining from meat consumption, (2) change his attitude towards the slaughtering of animals or (3) remove the link between the slaughter of animals and consuming meat. In the first solution, a consumer can decide to restrain from meat consumption, since the surest way to eliminate tension associated with eating animals is not to eat them. They avoid the psychological imbalance through a behavioural choice driven by moral concern for animals or health motives and valuing animal welfare helps sustain and moralise vegetarian diets (Santos and Booth 1996, Rozin, Markwith et al. 1997). However, although many consumers, including those who eat meat, dislike the idea that an animal is killed for consumption, the amount of vegetarian consumer seldom exceeds 10 percent of a national population (Ruby 2012, Loughnan, Bastian et al. 2014). Vegetarian consumer will be excluded from further analysis in this research, since they are a separate consumer group with different attitudes towards meat production and consumers compared to consumers who do eat meat.

The second solution is to change the attitude towards the slaughter of animals in order to maintain meat consumption. An example of this is the denial of mental capacities of livestock animals (Loughnan, Haslam et al. 2010). Eating a more 'mindful' animal is considered more morally wrong compared with an animal with less mental capacities. Consumers therefore tend to evaluate animals that are used for consumption as having less mental capacities than animals that are, for example, used as pets. Three researchers focussing on this topic, Brock Bastian, Nick Haslam and Steve Loughnan, found that Australian respondents who were about to eat dried beef viewed the cow as significantly less deserving of moral concern than respondents who were about to eat dried nuts. They conclude that eating meat leads to a reduction in moral concern for the animal eaten, and found the same result in a similar study (Loughnan, Haslam et al. 2010, Bastian, Loughnan et al. 2012, Loughnan, Bastian et al. 2014). Concluding, the animals that we eat are perceived as having less mental capacities and thus perceived to be less capable of suffering, thereby justifying its behaviour. (Ruby and Heine 2012, Loughnan, Bastian et al. 2014). Besides changing the perception of animals being able to suffer and therefore justifying meat consumption, another idea is that consumers do not bother at all that animals are killed for meat production. This would mean that consumers are well aware of the fact that animals are killed for meat production and that they do not feel discomfort when they are being reminded about this.

The third solution can be described as removing the link between the consumption of meat and the slaughter of animals, making it two separate factors that are not linked with each other. Over the last decades, this phenomenon has been taking place in the meat production and consumption industry. The increased distance between consumers, the meat production environment and the de-animalized presentation of meat products in the shopping environment are contributing in the increased distance between meat products and animals. It might have influenced our perception towards meat products. In the first half of the 20th century, this distance between the slaughter of an animal and consumption of meat was rather low. Slaughterhouses still operated in the middle of towns, and slaughtering of animals in the domestic area was common. What followed after the Second World War was a worldwide transformation of agriculture from using traditional, low-tech methods to its current intensive use of energy, fertilizers, machinery, biocides and irrigation. This has led to significant increases in agricultural production. and led to a shift from small peasant farming into an industrial livestock production, with the introduction of the slaughter line (Rifkin 1992). Since then, less people were involved in killing animals for human consumption (Fiddes 1991, Vialles 1994) and more people moved from rural areas towards urban regions. This resulted in an increased distance in the organic contact between people and livestock animals (Twigg 1984, Antrop 2004). The intensification of meat production, at least in The Netherlands, continued to grow. The total amount of livestock farms decreased from 28.280 to 16130 farms between 1990 and 2004 and a further expectation of a decreased employment rate of 13 percent in 2015 (Dutch Ministry of Agriculture 2005).

The slaughtering of animals for meat production nowadays has become an invisible, exiled activity. We know it goes on, but it is an abstract kind of knowledge (Vialles 1994: 5). The complexity of industrial production has, in consumer's eyes, introduced a strong distinction between the animal as a whole and the 'meat (pieces)-services' merchandise (Magdeleine, Spiess et al. 2008). Rifkin (1992) elaborated on the result of the intensification of cattle during the 20th century. He states that the children of the industrial world have little relationship to or understanding of the animals they eat, and are often shocked on coming upon a carcass hanging in a butcher shop. Meat has become a produced commodity rather than a remainder of an animal.

2.3 Changes in the meat environment

Accompanied with the increasing distance between the consumer and the producer of meat products, the amount of meat that is consumed has increased as well. Increasing investments and innovations in livestock resulted in meat becoming available at lower prices to almost all Western consumers in the second half of the twentieth century. Together with an increase in income and wealth, consuming more meat became available for many Western consumers (Grigg 1995, Vinnari and Tapiola 2009).

The per-capita consumption of animal products in Europe has increased by 40-50 percent over the period from 1961 to 2007, mainly due to this increased welfare and the relative decreased prices of meat products (Vinnari, Mustonen et al. 2010, PBL 2011, Geeraert 2013). The amount of meat consumed in The Netherlands increased to an average of 42 kilogram per capita per year in 2012 (Productschap Vee 2010, Productschap Vee 2013). The role of meat in the dietary pattern of the Western consumer has changed from an exclusive product that was consumed once or twice a week to a centrepiece in the daily meal, available for a large group of Western consumers for almost every day of the week.

Next to the increase in meat consumption, a shift towards more convenience in food preparation has been taking place as a result of changing lifestyles. Supermarkets have responded to the need of consumers who want make their meals that fit with their busy lives, with more processed (and less fresh meat products) that can be prepared quick and easy (Resurreccion 2004). One result of this is the increased consumption of meat at the supermarket instead of the butchery. Little research publicly available has been done in finding differences in consumer characteristics between those who buy meat in the supermarket and those who buy meat at the butchery. There

has been done some research in Turkey, but this is not representative because of the large differences in income and culture regarding meat consumption (Kizilaslan, Gokalp Goktolga et al. 2008). Research in 2008 done by *Hoofdbedrijfschap Detailhandel* and *Koninklijke Nederlandse Slagersorganisatie* found different profiles of meat consumers, who differ in their preferred place of purchase for meat products (Detailhandel and Slagersorganisatie 2008). The three most important reasons to buy meat at the supermarket were the comfort in buying all groceries at one location, the price level of the products and the comfort of the products being pre-packed which accelerates shopping.

Over the last decades, consumers are buying meat at supermarkets than at butcheries and this number is increasing. Between 1995 and 2012, the percentage of pre-packed meat products has increased from 50 to 93 percent of the total meat products sold in The Netherlands. About 75 percent of our total amount of meat consumption is spent at the supermarket and only 18 percent at butcheries (Productschap Vee 2010, Productschap Vee 2013). It is suggested that the presentation of meat products at butcheries have more reference towards animal origins than the presentation of meat products at supermarkets. This is because meat at butcheries is mostly presented unpacked and more animal origins are present at a butchery. Animal origins of meat are parts of the animal like heads, legs, tails, which may be considered evidence of the living past of the animal. The more human beings can see these parts, the more they are aware that a meat product was once part of a living animal (Buscemi 2014). The way meat is presented to consumers in supermarkets avoids triggering horror or sympathy, being in neat and nicely wrapped packages in a clean environment. It is presented in conspicuously hygienic conditions with all preparation completed and out of sight of the consumer (Fiddes 1991, Hopkins and Dacey 2008). Separating the living animal from the meat product is an effective way to prevent consumer's moral aversion towards animal suffering. The presenting of meat with no reference towards the living animal is called the de-animalization of meat, which weakens the link that consumers have between meat and the living animal (Vialles 1994, Magdeleine, Spiess et al. 2008, Fresco 2012).

2.4 Willingness to be confronted with slaughtering process

Some authors state that because the increased shopping at the supermarket for meat products, the psychological distance between livestock and the consumer has increased. A lack of exposure to meat in its raw form is stated to have led to an almost universal reaction of disgust to confrontations with the link between meat and an animal (Hoogland, de Boer et al. 2005). However, little research has yet been done about this refusal of consumers to be reminded of animal origins regarding meat production. Dagevos (2012) and Mayfield et al (2007) have asked respondents about whether they like to be confronted with animal origins of the meat that they eat. They both found consumer heterogeneity in whether they, when eating meat, did not like to think of it coming from a once living animal. About 20 to 30 percent of the Swedish, British and Italian respondents were concerned about the fact that meat is obtained from once animals. (Mayfield, Bennett et al. 2007) (it is not known whether these were meat consumers or vegetarian consumers). Dutch respondents in 2012 stated that 78 percent of the consumers can accept that meat is obtained from once living animals. However, less than 15 percent actually stated that they, when are eating meat, are willing to the animal that from which the meat comes from (Dagevos, Voordouw et al. 2012).

It will be examined in this study if the meat purchasing environment has any influence in the willingness for meat consumers to be confronted with the meat production process. If Heider's balance theory is linked with the differences between a butchery and a supermarket, then the place where a consumer buys their meat influences the link between killing animals and meat. In the supermarket environment, the link between meat and killing animals is diminished. Consumers can therefore maintain their attitude towards killing animals: they dislike it. The disliking of animals being killed for meat production probably causes the refusal to watch a video of the slaughtering of an animal. The negative attitude towards the process of meat production and killing animals is not triggered by the consumer who buys meat at the supermarket. This is shown in Fig 2, where the

negative attitude towards killing animals and positive attitude towards eating meat is maintained since the link between meat and killing animals is diminished in the supermarket environment.

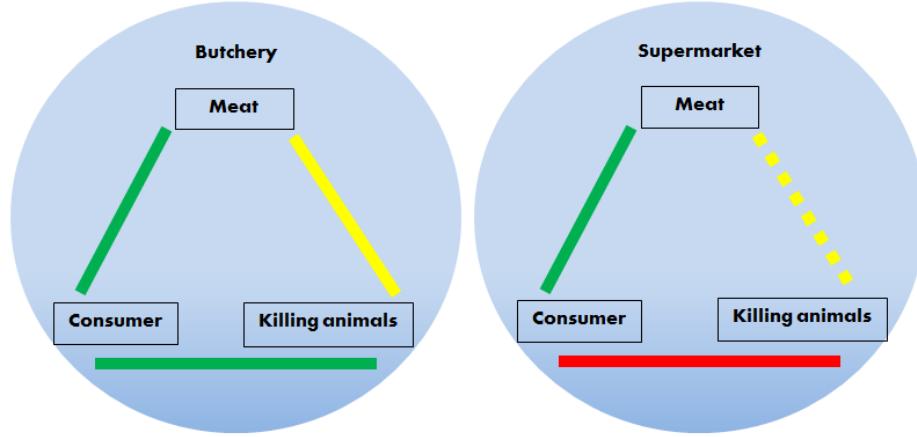


Fig 2: Balance theory linked with supermarket and butchery

It is expected that consumers who buy meat at butcheries cannot easily diminish the relationship between killing animals and meat. They should be more familiar with images of meat in its raw form, unpacked and with more presence of animal origins, which should make them feel more common with the idea that an animal is killed for the production of meat. He is therefore more likely to adjust his opinion towards the killing of animals, have a more positive attitude towards this and are therefore more likely to be confronted with the meat production process. Hypothesis 1 is stated as follows:

H1: The percentage of meat that is bought at the butchery is positively related towards the willingness to be confronted with the meat production process.

2.5 Predictive power of meat characteristics

Different meat characteristics can be in favour or against meat consumption and meat production. It has been also described that during the past decades the gap between meat production and meat consumption has increased. If this is the case, then attitudes about meat production should not influence the amount of meat that is consumed. It will be examined whether meat characteristics regarding meat production and consumption are of influence in the willingness to see the slaughter process and weekly meat consumption. It is expected that consumers with a positive attitude towards meat production characteristics are more likely to watch a slaughter video and consumers with attitudes in favour of meat consumption are more likely to eat more meat per week.

Because of the gap between meat production and meat consumption, it is expected that attitudes towards meat production do not relate with the weekly amount of meat that is consumed, and that attitudes towards meat consumption do not relate with the willingness to be confronted with the meat production process.

H2: Attitudes in favour of meat production are positively related towards the willingness to be confronted with the meat production process.

H3: Attitudes in favour of meat consumption are not related towards the willingness to be confronted with the meat production process.

H4: Attitudes in favour of meat consumption are positively related towards the amount of meat consumption per week.

H5: Attitudes in favour of meat production are not related towards the amount of meat consumption per week.

2.6 Effect of meat consumption

It is not known whether consumers who are more willing to be confronted with the meat production process have a higher or lower meat consumption. However, since it is expected that there is no link between the attitudes in favour of meat consumption and the willingness to be confronted with the meat production process, it is also expected that the actual meat consumption has no relation in the willingness to be confronted with the meat production process. Hypothesis 6 is therefore stated as follows:

H6: The willingness to be confronted with the meat production process is not correlated with the amount of meat that is consumed.

2.7 Conceptual framework

Figure 3 and figure 4 visualize the stated hypotheses.

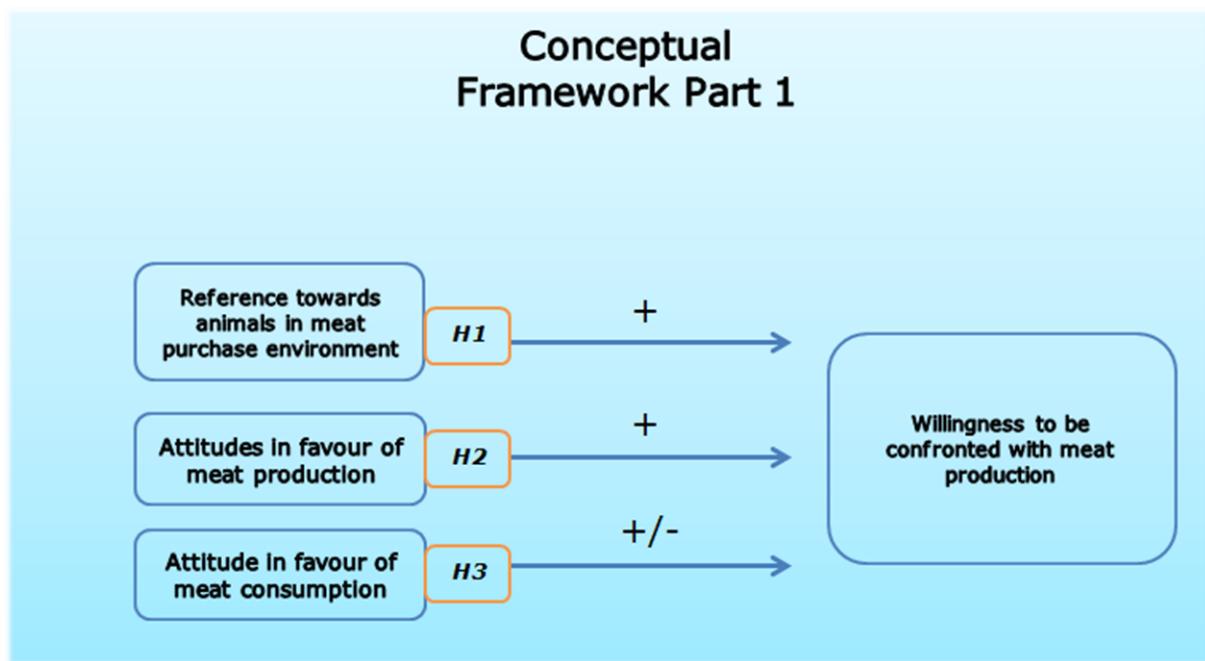


Fig 3: Conceptual framework 1

Conceptual Framework Part 2

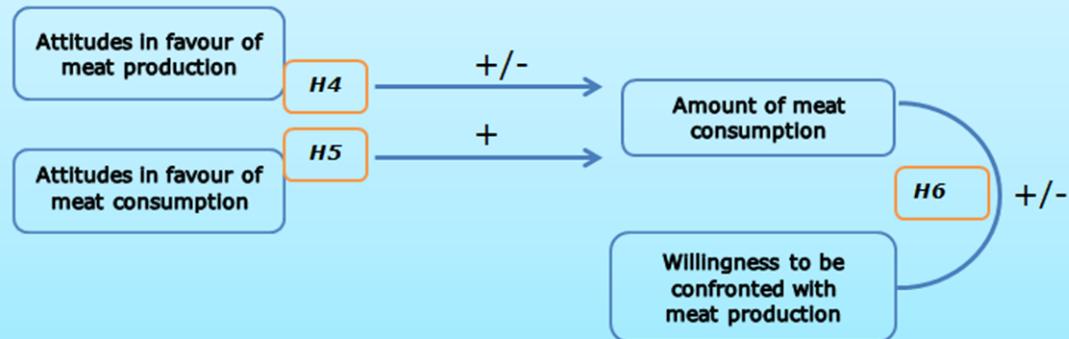


Fig 4: Conceptual framework 2

3. Methodology

3.1 Design and respondents

The willingness to be confronted with the meat production process was tested by giving meat consumers the opportunity to watch a video where an animal is killed for meat production. An online survey was done to test and to measure the weekly amount of meat consumption. Respondents were not informed at beforehand about the fact that they were about to make a choice between watching a slaughter video or not. If they would have been informed at beforehand, respondents who did not want to see the video might have avoided participating in this study, resulting in biased results. Instead, potential participants were informed that they were about to participate in a study about consumer habits in meat consumption. For the acquisition of respondents, a request to participate in the survey was put on the timeline of the Facebook page of the researcher; it was shared by four persons.

3.2 Procedure

Consumers were asked how many days of the week on average they eat meat product during dinner, and what is the amount of meat they eat on a day they eat meat products during dinner. Meat consumption was measured with two food frequency questions. It has been shown that this is a reasonable valid way of estimating the amount of meat consumption. (Hu, Rimm et al. 1999). Consumers were then asked whether they buy meat more often at the supermarket or at the butchery. They could divide a scale between 100 percent supermarket and 100 percent butchery or other meat specialists. In order to discover to what extent respondents agree with the statement that a supermarket is a place with a low level of reference towards animals, they were asked to give ratings to what extent the reference towards an animal is present at the butchery or the supermarket. The respondents agreed with the statement that a butchery has more reference towards living animals than a supermarket, $t (1,222) = -9.5, p < .001$.

Three attributes were used to measure the general attitude of respondents towards meat consumption. They were based on the attributes that consumers have stated to miss the most when they (had) decided to stop eating meat. Respondents could answer on a semantic differential scale on the following topics regarding meat consumption:

- Meat is easy to replace/difficult to replace as a meal component
- Eating meat is /healthy unhealthy
- Meat has a good taste/ does not have a good taste

An important attribute for many western consumers in meat consumption is their association with nutritional benefits or health concerns. Many vegetarian consumers believe restraining from meat consumption has personal health benefits, while in Canada health benefits of meat was one of the main reasons for former vegetarians to start eating meat again (Rozin, Markwith et al. 1997, Fox and Ward 2008). The same respondents in Canada stated that missing the taste was another main reason in favour of meat consumption, while in Australia consumers stated that unwillingness to alter eating habits and enjoying eating meat were the main barriers to adopt a vegetarian diet (Barr and Chapman 2002, Lea and Worsley 2003). Habit in meat consumption is rigid and a lack of familiarity and skill hampers the preparation of real vegetarian meals (Saba and Di Natale 1998, Schösler, Boer et al. 2012). The three attitudes towards meat consumption were not taken together as one general attitude towards meat consumption, since they were all measuring different aspects of meat consumption. It's accompanied Cronbach's Alpha is .371, meaning a low correlation between the three variables.

Another three attributes were used to measure the general attitudes of respondents towards meat production, based on important characteristics of meat production. They were also measured with use of a semantic differential scale:

- I feel discomfort/ no discomfort in the fact that animals are killed for the production of meat
- Animals in the livestock sector on average live in bad/good animal welfare conditions
- The production of meat is harmful/not harmful for the environment

The ethical aspect of animals that need to suffer for meat production is one of the most disputable arguments in meat production (Santos and Booth 1996, Rozin, Markwith et al. 1997, Vinnari, Mustonen et al. 2010). Welfare conditions in the current livestock sector also is an eloquent topic, as was found in Belgium and Croatia (Verbeke, Van Wezemael et al. 2010, Cerjak, Karolyi et al. 2011). A third factor regarding the production of meat is its environmental impact. Although this is less seen as important by consumers, it is taken into account by some consumers to see if this has any influence in the willingness to watch the slaughter video (Lea, Crawford et al. 2006, Fox and Ward 2008). These three topics of meat production all measure a different aspect. The respondents scores confirm this, since the Cronbach's Alpha of these three variables is 0.491, meaning a low correlation between the three different variables.

When respondents were halfway through the survey, they were informed that they were about to watch a video of the slaughtering process. Three different videos were randomly divided between groups. Two of them included a cow slaughter, one included a pig slaughter. One of the videos involves a slaughter that took place at a rural farm; this video was shot in the 1970s. Two videos show a more recent video. This diversity between videos is done in order to control for any unforeseen reasons why one of the three videos is evaluated or expected different than another. The focus is put on whether the respondent is willing to watch a video of the slaughtering, regardless of the type of animal they eat or the method how the animal is killed. At first, three snapshots of the video were shown to each respondent before giving the option to watch the video. The snapshots consisted of 1) a picture of the animal before slaughtering, 2) the moment upon which the animal is killed and 3) the dead animal with his skin removed.



Fig 5: First snapshot of one of the three videos



Fig 6: Second snapshot of one of the three videos



Fig 7: Third snapshot of one of the three videos

The fragments were all obtained and streamed from Youtube. They were cut into fragments of 2 to 3 minutes in order to make it not a too much time consuming activity to watch the video, that otherwise could influence consumers in their willingness to watch the video based on time spending priorities.

3.3 Control variables for meat consumption and willingness to watch slaughter video

Some respondents might be more sensible towards a video where an animal is killed, regardless whether they buy meat at the butchery or at the supermarket. Also, the amount of meat that is consumed is influenced by factors other than the suggested variables. Three control variables will be taken into account in analysing the willingness to watch the slaughter video and the amount of meat consumption per week.

Whether someone is sensitive for images of blood in general will be taken into account, as this will probably influence whether someone wants to see a video where an animal is killed. Respondents were asked to what extent they are sensitive for pictures of blood in general. Since women in general are more disgust sensitive than men and might therefore be more likely to refuse to see a video of an animal being killed, both blood sensitivity and gender will be used as control variables (Fessler, Arguello et al. 2003, Kubberød, Dingstad et al. 2006). Furthermore, regardless of where consumers buy their meat products, gender might be influencing the willingness to see the video of the meat production process, since meat consumption is traditionally associated with masculinity (Fiddes 1991). It is a well-known argument that men tend to eat more meat than women (Prättälä, Paalanen et al. 2007). Gender is therefore taken into account as a control variable. Education also seems to be of influence in the amount of meat that someone eats. Higher educated consumers on average eat less meat than those with lower education (Schönfeldt and Hall 2012).

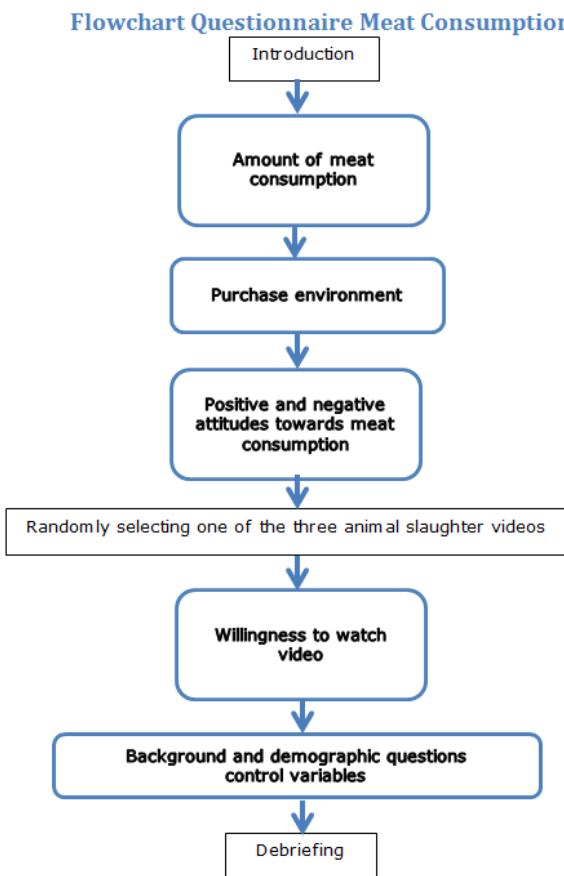


Fig 8: Flowchart

3.4 Data analysis

In order to see if there were any differences in the willingness to watch the video between groups, a chi-squared test and ANOVA were done on the differences in percentages of respondents who were willing to watch the video, as well as the percentage of the video that was watched and to what extent they felt discomfort in watching the video.

To test H1, H2 and H3, a Binary Logistic Regression was done with the independent- and control variables on the willingness to watch the slaughter video. The obtained beta weights show whether an independent variable is positively or negatively influencing the willingness to watch the video, and whether this is significant. For H4, H5 and H6, a Linear Regression was done with the independent- and control variables on the weekly amount of meat consumption. The obtained beta weights will show to what extent meat consumption is higher or lower for the independent variables. Significance level was set at .05 for all tests.

4. Results:

4.1 Overview

Table 1: Respondents overview

Respondents	281
Meat consumers	232
	141 Dutch
	71 Belgium
Females	129 (56%)
Average age	27.6 (SD 10.68, Range 16-68)
Higher education	162 (70%)

281 finished surveys were collected. 49 respondents stated that they do not eat meat at least once a week. These respondents were labelled as vegetarian and excluded from the analysis. Of the 232 meat consuming respondents, 129 were female (56%). Age distribution ranges from 16-68 with a mean of 28 years.

4.2 Willingness to watch slaughtering video

Table 2: Willingness to watch slaughtering video¹

	Video 1	Video 2	Video 3	TOTAL
Watched	47 (60%)	46 (65%)	48 (64%)	141 (63%)
Did not watched	31 (40%)	25 (35%)	27 (36%)	83 (37%)
TOTAL	78	71	75	224 ¹
Discomfort during watching ² (1 not at all – 7 very)	2.8 (SD 1.762)	2.3 (SD 1.524)	2.7 (SD 1.746)	
% of video watched	91% (SD 20.7)	80% (SD 27.6)	82% (SD 27.2)	

¹ One respondent decided to withdraw from watching after she decided to watch and was therefore moved to the 'not watch' category. Eight respondents who choose not to watch the video stated that they had no time or a slow internet connection, so it might be that they actually were willing to watch the video in different circumstances. They are removed from the analysis.

² Seven of the respondents stated that they could not load the video during slow internet connection or the absence of Wi-Fi on their phone, or that they had time constrains, therefore were unable to watch the video. These respondents are removed in answering this question

On average, 63 percent of the respondents chose to watch the video. The willingness to watch the videos in percentages were 60 for group 1, 65 for group 2 and 63 for group 3. These differences are not significant, χ^2 (2, N = 224) = .381, p = .827. It was also tested if there were any differences in the discomfort that respondents felt watching the video, and if they because of that did not watch the whole video. No significant difference were found between these groups whether they felt discomfort in watching the video, F (2, 138) = .802, p=.450. On average 84 percent of the video was watched, with no significant differences between groups, F (2,133) =2.865, p=.061. Therefore it can be concluded that there is no significant difference between the three selected videos when analysing the willingness to watch the slaughter video.

4.3 H1, H2, H3: Willingness to watch the slaughter video

Table 3: Logistic Regression in the willingness to watch the slaughter video

Variables	Beta Weights	Wald	p<
Blood Sensitive	-.773	25.390	.001
<i>"I find it difficult that an animal is killed for the production of meat"</i>	-.362	12.421	.001
<i>"Animals in the livestock sector on average live in bad animal welfare conditions"</i>	-.356	4.737	.05
Gender ¹	.762 ²	4.438	.05
Percentage of meat bought at butchery ³	-.010	2.821	NS ⁴
<i>"Eating meat is healthy"</i>	-.010	.020	NS
<i>"I find it hard to replace meat as a meal component"</i>	-.044	.631	NS
<i>Meat has a good taste</i>	-.039	.093	NS
<i>The production of meat is harmful for the environment</i>	-.051	.005	NS

1 Female

2 The exponential of this categorical variable Beta Weight is 2.14, meaning that women are 2 times more likely to refuse to watch the slaughter video than men

3 On average, 74% of the meat was bought at the supermarket (SD 20,4). 55% of the respondents buy 90% or 100% of its meat at the supermarket, so there a minor group who regularly consumes meat at the butchery in this sample.

4 NS=Not significant

Table 4: Goodness of fit test

Tests	χ^2	df	p
Likelihood	75.695	9	<.001
Hosmer-Lemeshow Goodness of fit test	2.970	8	.936

Nagelkerke (Max rescaled) $R^2 = .391$

Table 3 shows the output of the Logistic Regression on the willingness to watch the slaughter video. The independent variables were tested on Multicollinearity. None of the variables had a tolerance level below .700, indicating that there were no multiple correlations of sufficient magnitude to have the potential to adversely affect regression estimates. As predicted, blood sensitivity and gender are influencing the willingness to watch the slaughter video. Women in general are two times less likely to watch the slaughter video, and the high level of self-stated blood sensitivity is associated with a low willingness to watch the video. The percentage of meat that is bought in either the butchery or supermarket does not significantly influences the willingness to watch the slaughter video. H1 is therefore rejected.

H2 is accepted for attitudes towards the discomfort someone has about the fact that animals killed for meat production and attitude towards the welfare conditions of livestock animals. Attitude toward the environmental impact of meat production had no significant influence on the willingness

to watch the video. No attitude towards meat consumption was found to be significantly predicting the willingness to watch the video, as was expected. Therefore, H3 is accepted.

There was a significant difference in the willingness to watch the video between Dutch (66 percent) and Belgium (50 percent) respondents, $X^2(1) = 5.56$, $p < .05$. Also age and education influences the willingness to watch the slaughter video. Those who watched the video were on average 26 years of age (SD 8,9), those who refused to watch the video were on average 30 years of age (SD 12,6), $T(1,222) = -2.848$ $p < .01$. From the higher educated respondents, 69% wanted to watch the video, compared with 51% of lower educated respondents, $X^2 (1) = 6.442$, $p < .05$.

4.4 H4, H5, H6 Meat consumption

Table 5: Linear Regression on meat consumption

Linear Regression on meat consumption ¹	Beta Weight	T	P <
Gender ²	-102.40	-3.141	.01
Education ³	-111.60	-3.063	.01
<i>"I find it hard to replace meat as a meal component"</i>	32.10	3.397	.01
<i>I find it difficult that an animal is killed for the production of meat</i>	-23.80	-2.434	.01
<i>"Meat has a good taste"</i>	20.20	1.483	NS
<i>"Eating meat is healthy"</i>	11.80	.061	NS
<i>"The production of meat is harmful for the environment"</i>	-2.90	-.019	NS
<i>"Animals in the livestock sector on average live in bad animal welfare conditions"</i>	-9.60	-.047	NS

¹ 25 respondents who stated to consume meat did not fill in the amount of meat they consume on a daily basis. These respondents were excluded in the analysis regarding meat consumption.

² Female

³ Respondents who have finished or were following higher education

Adjusted R² = .240

Table 5 shows the output of the Linear Regression on meat consumption. The independent variables were tested on Multicollinearity. None of the variables had a tolerance level below .700, indicating that there were no multiple correlations of sufficient magnitude to have the potential to adversely affect regression estimates. Normal distribution of the semantic differentials is not expected, since it is not assumed that consumers on average are in middle scores of the semantic differentials.

The average amount of meat consumed during dinner by the respondents is 548 gram per week (17.2 SD). This is an average of 28.5 kilogram per year. This seems to be lower than the Dutch average; however meat products consumed during lunchtime, such as cold cuts, and during night-time, such as deep fried snacks, are not taken into account. As expected, education and gender influenced the amount of meat consumption per week. Respondents who follow or have followed higher education on average eat 118 gram less meat per week. Females on average eat 111 gram less meat per week. Respondents who agreed on the statements "*I find it hard to replace meat as a meal component*" significantly state to eat more meat per week. Therefore, H4 is accepted for the attitude concerning meat as an irreplaceable component of the meal. Almost all respondents agreed that meat has a good taste and no significant effect was found that influenced the amount of meat consumed per week. The aspect of meat being healthy or not did not influence meat consumption either.

It was expected that attitudes towards meat production were not related to the amount of meat that is consumed. However, the results show that those who did not feel inconvenient in slaughtering an animal eat more than those who do feel inconvenient. H5 is therefore rejected for the discomfort in animals being killed for meat consumption. Blood sensitivity had no positive nor negative relation with the amount of meat consumed per week.

Respondents who watched the slaughter video (575 gram, 223.5 SD), eat significantly more meat per week than those who did not watch the video (501 gram, 264.7 SD) $t (1, 205) = 2.096$, $p < .05$. H6 is therefore rejected.

5. Discussion

This research is one of the first to elaborate on the actual willingness for meat consumers to be confronted with the meat production process. The goal of this research was to get insight in the willingness of meat consumers to be confronted with the meat production process by showing them an animal slaughter video. Since there were no significant differences found in the willingness between the three different videos, it gives a reliable estimation of the willingness of respondents to watch one of the three slaughter video's which are used in the experiment. No significant differences were found in this willingness. In earlier research by Dagevos (2012), it was found that a lower percentage than results from this research wanted to be confronted with meat production. However, they measured this willingness on a different way (Dagevos, Voordouw et al. 2012). They asked respondents to agree/disagree on the statement "I would like to see the animal of which the meat I buy comes from", on which only 13% agreed. However, seeing the actual animal that provides the meat product is something different than watching a video of an animal being killed for meat production.

According to Heider's balance theory, consumers need to have a consistent link between meat, killing animals and their meat consumption behaviour. Consumers who feel psychological imbalance could either stop eating meat, accept that animals are killed for meat production or buy in an environment with low references towards animal origins. The results of this study suggest that the de-animalized meat environment does not have influence in a decreased willingness for consumers to be confronted with meat production. Although respondents agreed with the statement that butcheries have more reference towards living animals, meat consumers who do not like to watch the slaughter video do not shop more at the supermarket than meat consumers who did watch the video. However, consuming meat products and a negative attitude towards the slaughter of animals are both present for some consumers. It seems that the psychological imbalance might be solved by the psychological distance between the killing animals and the meat purchasing environment. A consumer does not have to think about the slaughter of animals when buying meat product, regardless they buy it at a butchery or supermarket. This might also explain why the Dagevos study in 2012 found that only few respondents agreed to be confronted with the animal that has produced the meat they eat, since this would imply a strong link between meat consumption and meat production. Watching the video of a random animal being slaughtered might have a stronger psychological distance than watching the slaughter of the cow that has provided the steak that you are about to buy.

It was further suggested that attitudes towards meat production were not related towards meat consumption. A study done by Cerjak et al (2011) found that most Croatian meat consumers do not consider animal welfare when buying meat. A study done in 2004 compared French, Danish and Swedish meat consumers, who all admitted that images regarding the production methods of meat did not influence their purchasing habits (Ngapo, Dransfield et al. 2004). A Dutch study comparing farmers and consumers in their attitudes towards animal welfare found similar results. The buying behaviour of consumers does not simply reflect their attitude towards the way animals in intensive farming are treated. (Te Velde, Aarts et al. 2002). This study confirms whether a consumer agrees or disagrees that livestock animals live in bad welfare conditions were not of influence on their meat consumption. However, the results of this study do indicate a link between the discomfort someone feels regarding the killing of animals and their meat consumption. Not only was the discomfort towards the killing of animals negatively influencing meat consumption, those who refused to watch the video on average eat less meat per week. Concluding, the more discomfort a consumer feels towards killing animals, the less meat he or she is likely to eat. There is a relationship between the general attitude towards the slaughtering of animals and the amount of meat someone eats. This is particularly the case with female and/or blood sensitive meat consumers.

There are some limitations in this study that have to be taken into account. The range of the daily amount of meat consumption had a maximum of 150 gram per week, based on the average of meat consumption per year in the Netherlands, divided by 365 days. Since seventeen percent of the respondents filled in this maximum amount, it is not known whether they eat more than this amount. Also, more than two thirds of the respondents bought 20 percent or less of their meat at the butchery, making this data positively skewed. The fact that no significant difference was found between the place of meat purchase and the willingness to watch the slaughter video might be due to this low percentage of butchery customers in the respondents group. One might argue that Dutch supermarkets differ in their presentation of meat products; a large supermarket might have a broader assortment and a separate butchery department.¹⁸

The amount of respondents that wanted to watch the video was influenced by blood sensitivity, gender, level of education and age. Since the respondents on average were high educated, young of age and not blood sensitive, this might positively influenced the willingness to watch the slaughter video. A respondent group with different demographic characteristics might show a different percentage of willingness to watch this video. Organisations such as 'Wakker Dier' who want to reduce meat consumption by confronting meat consumers with images of the meat production process are advised to focus on the aspect of the killing of an animal than to focus on the animal welfare condition in order to reduce meat consumption. Although not every consumer of meat products will be susceptible for this - respondents who watched the video on average did not feel uncomfortable to think that meat comes from once living animals - it might have an impact on blood sensitive and/or female meat consumers.

It is however not known if being confronted with images of slaughtered animals for meat production influences the (intention to reduce) future meat consumption. The slaughter of animals and the livestock welfare conditions are not visible at the meat purchasing environment, creating a high psychological distance. It is this psychological distance that maintains an uncomfortable feeling towards living conditions and meat consumption at the same time. The intention to reduce meat consumption after a consumer is shown a slaughter video might be different than the actual purchase behaviour when a consumer is confronted with the slaughter of animals in the meat purchase environment. Future research should focus on an experimental design where consumers are about to buy meat products while being confronted with images or a video of the slaughter of an animal for that meat product.

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7. Appendix: Online Survey

Fijn dat u mee wilt doen aan dit onderzoek! Deze vragenlijst maakt deel uit van mijn afstudeerproject over vleesconsumptie.



Het invullen van de vragenlijst zal ongeveer 10 minuten duren. Er zijn geen goede of foute antwoorden, wilt u invullen wat als eerste bij u opkomt? Als deelnemer aan dit onderzoek blijft u geheel anoniem. Er zijn geen risico's of voordelen verbonden aan het invullen van de vragenlijst.

U kunt op ieder moment beslissen om te stoppen met invullen. Voor eventuele vragen kunt u contact opnemen met Wouter van der Sleen (wouter.vandersleen@wur.nl).

Door op 'ja' te klikken geeft u aan dat u bovenstaande hebt gelezen en ermee instemt:

ja, ik doe mee aan dit onderzoek

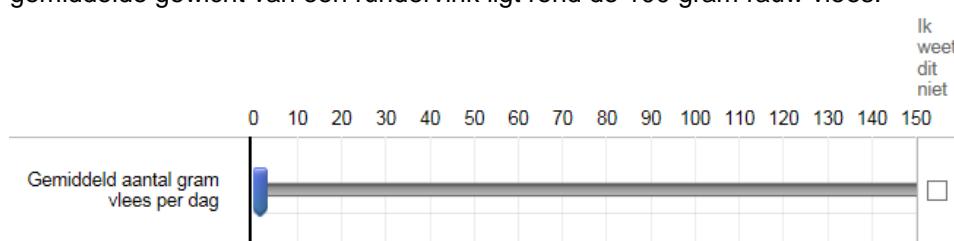
Eet u minstens één dag per week vlees? Hieronder verstaan we al het vlees afkomstig van dieren, behalve vis.

Ja
 Nee

Hoeveel dagen per week eet u gemiddeld vlees bij de avondmaaltijd? Hieronder verstaan we al het vlees afkomstig van dieren, behalve vis.

1 dag per week
 2 dagen per week
 3 dagen per week
 3 dagen per week
 4 dagen per week
 5 dagen per week
 6 dagen per week
 7 dagen per week

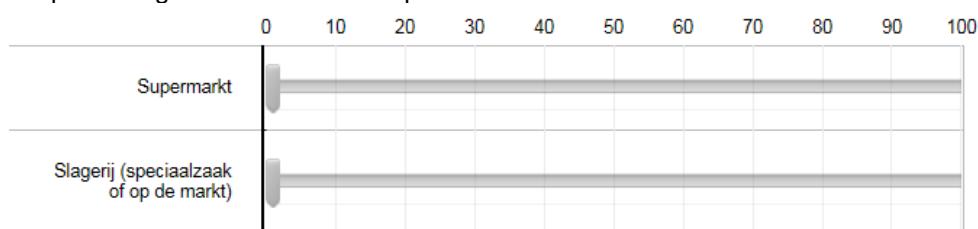
Als u vlees eet tijdens de avondmaaltijd, hoeveel gram vlees eet u dan gemiddeld? (Als u meer dan 150 gram vlees per dag eet kunt u 150 gram selecteren). Ga hierbij uit van rauw vlees. Ter info: het gemiddelde gewicht van een rundervink ligt rond de 100 gram rauw vlees.



Hoeveel % van het vlees dat u koopt haalt u bij de onderstaande winkels?

Klik 0% aan als u nooit vlees koopt in de betreffende winkel.

De percentages moeten samen optellen tot 100%.



In hoeverre bent u het eens met de volgende stellingen?

	Helemaal niet mee eens	-	-	Neutraal	-	-	Helemaal mee eens
Een vleesafdeling in een supermarkt doet mij denken aan de oorsprong van het vlees: de dieren	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Het assortiment van een slagerij doet mij denken aan de oorsprong van het vlees: de dieren	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

De volgende vragen gaan over vleesproductie en vleesconsumptie. U kunt aangeven in hoeverre u het eens bent met de volgende standpunten:

Vlees eten is ongezond	<input type="radio"/>	Vlees eten is gezond						
Ik vind het niet zielig dat een dier geslacht wordt voor vleesproductie	<input type="radio"/>	Ik vind het zielig dat een dier geslacht wordt voor vleesproductie						
Vlees is gemakkelijk te vervangen in een maaltijd	<input type="radio"/>	Vlees is moeilijk te vervangen in een maaltijd						
Dieren in de veehouderij hebben over het algemeen een slecht leven	<input type="radio"/>	Dieren in de veehouderij hebben over het algemeen een goed leven						
Vlees smaakt niet lekker	<input type="radio"/>	Vlees smaakt lekker						
Vleesproductie is niet schadelijk voor het milieu	<input type="radio"/>	Vleesproductie is schadelijk voor het milieu						

Onlosmakelijk verbonden aan het eten van vlees is het houden van dieren, en het slachten ervan: U krijgt straks de mogelijkheid om een video te bekijken waarin een dier wordt geslacht en vervolgens wordt uitgebeend. U hoeft deze video niet te bekijken.

	Helemaal niet vervelend	-	-	-	-	-	Heel erg vervelend
Vindt u het vervelend om zo'n video te bekijken?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Hieronder ziet u drie screenshots van het fragment. Het fragment duurt in totaal 2 minuten





Wilt u dit fragment bekijken? Als u "Ja" selecteert, wordt u geleid naar de video. Als u "Nee" selecteert, dan wordt u naar het laatste gedeelte van deze enquête gestuurd

Ja ik wil deze video bekijken

Nee ik wil deze video niet bekijken

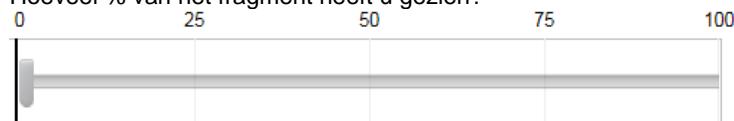


Those who watched the video

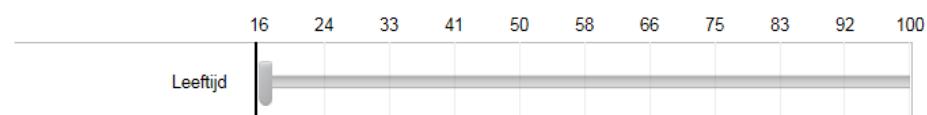
In hoeverre vond u het vervelend om dit fragment te bekijken?



Hoeveel % van het fragment heeft u gezien?



Wat is uw leeftijd?



Wat is uw geslacht?

Man

Vrouw

What is a reaction mixture?

- Nederlands
- Belgisch
- Anders

In hoeverre bent u gevoelig voor het zien van bloed in het algemeen?

In hoevele be

9

8

Zoos aangelegd

9

- Heeft u nog vragen/opmerkingen?
- Indien u benieuwd bent naar de resultaten van dit onderzoek, kunt u hieronder uw e-mailadres invoeren. U wordt dan op de hoogte gebracht wanneer het onderzoek is afgerond.
- Aan Wageningen Universiteit worden vaker studies verricht waarvoor wij deelnemers zoeken. Mogen wij u vaker per e-mail benaderen (gemiddeld hooguit 1 keer per maand)?
- Zo ja, schrijf dan hieronder uw e-mailadres:
- Dit is het einde van de vragenlijst. Hartelijk dank voor uw medewerking! Wanneer u doorklikt naar de volgende pagina worden uw antwoorden verwerkt.